ACCIDENT

Aircraft Type and Registration:	Reims Cessna F172M Skyhawk, G-BFPM
No & Type of Engines:	1 Lycoming O-320-E2D piston engine
Year of Manufacture:	1975
Date & Time (UTC):	9 August 2008 at 1036 hrs
Location:	The Old Airfield, Strubby, Alford, Lincolnshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 3
Injuries:	Crew - None Passengers - 2 (Serious) 1 (Minor)
Nature of Damage:	Moderate
Commander's Licence:	Private Pilot's Licence
Commander's Age:	44 years
Commander's Flying Experience:	582 hours (of which 105 were on type) Last 90 days - 10 hours Last 28 days - 3 hours
Information Source:	AAIB Field Investigation

Synopsis

Following a flight in the local area, the aircraft was landing back at Strubby, where there was a significant crosswind from the left. The initial touchdown was followed by a bounce, following which the left wing lifted and the aircraft turned to the right. The pilot applied full power with the intention of conducting a go-around, but the aircraft stalled into a standing crop to the right of the runway and turned over onto its back. The pilot was uninjured but an elderly passenger suffered a heart attack on the following day. The remaining passengers required on-going hospital treatment.

History of the flight

The flight was planned as a surprise 80th birthday present for a local man and had been arranged approximately one month beforehand when a member of his family approached an acquaintance, who was a pilot and who owned a Cessna 172 aircraft based at Strubby. However, a few days before the agreed date, the pilot realised he had a domestic commitment that would prevent him from fulfilling the task; he therefore asked a friend, who also owned a Cessna 172, if he could conduct the flight. The friend agreed to do this as a favour, although he had not met the family.

An approaching weather system threatened to postpone the flight, which was intended to be approximately one

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hour's duration in the local area. However, on the day before the flight, the pilot checked the forecast and decided that conditions would be satisfactory for the following morning, although the approaching weather front would cause conditions to deteriorate later on. Accordingly he contacted the family, asking them to be at the airfield at 1030 hrs, although, having re-checked the forecast early on the day of the flight, he made a further telephone call, asking the passengers to attend the airfield one hour earlier, at approximately 0930 hrs.

In the event, the family arrived at Strubby somewhat later, although the exact time is unclear. The pilot, who had been checking the aircraft, ensured everyone was strapped in and took off at around 1030 hrs. The 80-year old passenger and his wife were in the rear of the aircraft, with their adult granddaughter in the front passenger seat. She had brought along a camcorder with which she subsequently filmed much of the flight, including the landing.

The flight proceeded normally, with the video footage confirming that although overcast, the visibility was good. There was some turbulence however, and the pilot became concerned on several occasions that his male passenger was feeling unwell. After flying over the passengers' home village, the granddaughter requested that they return to the airfield. The pilot interpreted this as an indication of concern for her grandfather, and decided to save time by conducting a 'straight in' approach, rather than flying a conventional circuit pattern. A wind turbine farm some 1.5 miles from the airfield and which was close to the approach path for Runway 26, provided an indication of the wind direction, and it became apparent that there was a significant crosswind component; a remark made by the pilot to this effect could be heard on the video recording.

The pilot selected the flaps, in stages, until he had full flap (40°) set by short final approach. The video recording showed that the aircraft nose was off-set to the left in order to maintain the runway centreline. Just before touchdown the pilot used the rudder to align the aircraft with the runway and made an apparently normal landing. However, a bounce ensued, following which the aircraft suddenly rolled and turned to the right. The pilot immediately applied full power and the aircraft flew a few feet above the surface on a track approximately 35° to the right of the runway heading. The stall warning horn was sounding continuously and, after several seconds, the nose dropped suddenly into a standing crop some 30 metres to the right of the runway and the aircraft turned over onto its back. Another member of the passengers' family who had been waiting at the airfield, telephoned the emergency services and assisted the occupants in vacating the aircraft. The pilot turned off the electrics and later returned to the aircraft to turn off the fuel. There was no fire, although a small quantity of fuel leaked from the tank vents.

The pilot was uninjured but the front seat passenger was heli-lifted to hospital. The rear seat occupants were taken by ambulance to hospital, where the grandfather suffered a heart attack on the evening of the following day. As a result of this, he underwent surgery approximately two weeks later.

Crosswind issues

An aftercast provided by the Met Office indicated that at around the time of the accident, an active warm front was lying approximately north-south over the east of England. Ahead (to the east) of the front, which had not yet reached the accident site, was a strengthening south-westerly wind. The 1050 hrs (local) wind observation at RAF Coningsby, some 30 miles to the southwest, was 210º/14 kt. Half an

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hour later, the Humberside Airport readings were similar, at 210º/17 kt. Other nearby surface reports, together with isobaric analysis, were used to estimate the surface wind speed and direction at Strubby. These were 210º/15 kt, with gusts to 26 kt. These would have given crosswind components for Runway 26 of 11.5 kt and 20 kt respectively.

The Flight Manual for G-BFPM contained the following note on crosswind landings:

> *'When landing in a strong crosswind, use the minimum flap setting required for the field length. Use a wing low, crab, or a combination method of drift correction and land in a nearly level attitude……..'*

Later models of Cessna 172 aircraft have maximum flap settings of 30º, compared with 40º available on G-BFPM. A Flight Manual for one such aircraft contained essentially the same advice as that given above, but noted that:

> *'If flap settings greater than 20º are used in sideslips with full rudder deflection, some elevator oscillation may be felt at normal approach speeds. However, this does not affect control of the airplane.'*

With regard to drift correction, it additionally stated that:

> *'…the wing low method gives the best control….'*

There was also a note stating that operation of this type of aircraft in direct crosswinds of 15 kt has been demonstrated.

Discussion

The meteorological aftercast indicated that, during the period between when the aircraft took off and its return to the airfield, the wind strength may have increased. Although the initial touchdown appeared normal, it is likely a gust caused the aircraft to roll to the right. Should the pilot have maintained the right rudder input he had applied to align the aircraft with the runway just before touchdown, then this may have been responsible for the turn to the right. In any event, when the pilot committed to a go-around, the aircraft was pointing significantly to the right of the runway heading, which may have eliminated any headwind component. This, together with the aircraft weight and the drag associated with the selection of 40° of flap, is likely to have prevented the aircraft from attaining flying speed.

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